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ABSTRACT

Supplemental or peripheral responses by test takers are seldom used by examiners, but in this study a program introduced by Thomas Edison State College (New Jersey) to allow the examined student to provide feedback to the testers and graders was studied. Student comment forms were designed to enable the student to identify problems with the test material or to explain or justify an answer. Results from seven classes indicate that from 11% to 39% of students actually write comments, and that student comments have been widely scattered across the potential domain. The introduction of the comment sheet has therefore not produced a burdensome number of student remarks. Many comments have little value to instructors and simply reflect personal misperceptions. Although the bulk of the comments do not offer major insights, the introduction of the comment sheet has been beneficial to the college's program. Students and testing staff are given greater protection against test-content errors and students near the critical standard have additional opportunity to defend their work and demonstrate competence. Appendix A gives comment-sheet samples, and Appendix B contains a student questionnaire. (Contains 7 references.) (SLD)

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ED 367 721

LISTENING TO TEST-TAKERS: THE USE OF SUPPLEMENTAL COMMENTS IN ASSESSMENTS

Thomas F. Donlon
Thomas Edison State College

A paper presented at the Annual Meeting of the National Council on Measurement in Education New Orleans, 1994

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Listening to Test-Takers:
The Use of Supplemental Comments in Assessments

Thomas F. Donlon
Thomas Edison State College

Introduction

Testers rarely make use of examinee responses other than those mandated by the test requirements. Supplemental or peripheral responses are ordinarily discouraged, or at least not invited, since they tend to require special handling, and since the application of the additional information to the test scoring and test evaluation processes can be a complex and perhaps costly undertaking.

The stimulus for the present paper is the introduction of a set of relevant practices within a specific college-centered credit-by-examination program, the Thomas Edison College Examination Program (TECEP). In an address by Wright (1991), concerning the conduct of assessments, she reported her experiences, and the concomitant difficulty, in implementing a system for inviting and evaluating test-subject responses within the context of a statewide assessment. In spite of the difficulty, she underscored the positive value to the assessment when this system was established. Her remarks stimulated a review of the TECEP program, and the introduction of the practices described below.

Background Literature

In spite of a reasonably vigorous search of the electronic data bases relevant to testing, no published articles on the usefulness of student supplementary responses to test questions were uncovered. Conrad (1951), writing in the 1951 Educational Measurement (Lindquist, 1951), advocated this type of activity, essentially as a component of the experimental tryout of materials. In a section called "Securing reactions of examinees" he wrote:

> Provisions should be made for noting down comments by examinees regarding the directions and content of the pretryout and tryout forms, and such comment should be carefully considered in revising the test. Inadequate directions and faulty items are often identified in this way.
>
> ...Unsophisticated test constructors sometimes tend to discount criticisms of examinees...when statistical data indicate no apparent basis for their criticisms. This is an unfortunate tendency because the criteria for item analysis leave much to be desired. Although item analysis data are often exceedingly helpful in test construction, they cannot and must not be relied upon to detect all the ambiguities and other faults of items. For various reasons, then, test constructors should accept with proper humility the comments of the examinees.
>
> (Conrad (1951), at page 257).

The succeeding edition of Educational Measurement, (Thorndike, 1971), made no mention of the use of examinee responses in this way. One chapter did state that "In addition to requesting the complete support of...examinees for the norming, a sample of them should be asked for a critical review of the final draft of the instructions." (Clemans, 1970, at page 190), but this was the only reference to inviting comment from examinees, and it is focused on the instructions rather than on test content.

In preparing this paper, the joint Standards (APA-AERA-NCME, 1985) were reviewed for any comment relevant to the evaluation of these practices, but none was identified. In general, as test development and administration are presented in the Standards, the judgment of the test-makers seems to be the primary protection against errors of communication.

TECEP Questionnaire Program

Thomas Edison State College is a two- and four- year nontraditional college in New Jersey that offers its students opportunities for credit-by-examination, supplemental to such major national programs as the College Board's CLEP program or the American College Testing Service's ACT PEP program, through its Thomas Edison College Examination Program (TECEP). Beginning in fall 1991, a program was introduced into TECEP that permits the examined student to provide feedback to the testers/graders concerning the examination or concerning their answer responses. The form developed, the Student Comment Sheet, is by design kept extremely simple. Three sample forms, as completed by students, are presented as Appendix A.

As indicated, the instructions for the form stress that it is intended to be used to identify problems with the test material, or to explain or justify an answer response. Experience has shown that this is almost entirely the use that is made; peripheral remarks are rare. As explained below, this is in part due to the use of a related questionnaire program on the more general conditions of testing. In general, remarks on the Student Comment Sheet are restricted to comment on or justification of answers and the related questions, and are intended by the student to be given to the grader/evaluator in order to win credit if possible.

The availability of this formal channel for an information exchange alters the dynamics of the testing. Multiple-choice questions, of course, have long been challenged as inappropriately forcing the test subject to use the language of the tester, as ambiguous and unclear to the test-taker, and as less desirable for these reasons than constructed-response questions. Essay questions and other constructed-response materials, however, are not "blameless" in these aspects. They do not ordinarily invite any kind of parenthetic comment that is to reflect the test-taker's reasoning and assumptions during the examination.

The bulk of the comment received to date within TECEP has in fact centered on multiple-choice questions. However, essay questions and other kinds of material are also commented upon. TECEP examinations vary in the extent to which they contain multiple-choice questions, with some examinations consisting entirely of multiple-choice material, others without any. A sizable proportion consist of both multiple-choice and constructed response questions. Multiple-choice questions are used for a number of widely-accepted reasons, including enhanced reliability, efficiency of scoring, and broader coverage of a subject matter domain.

Regardless of question type, the student comments are uniformly brief and to the point. The typical student comment to multiple-choice testing is instanced in the following examples:

Examination	Question	Comment
Introduction to Statistics	40	D cannot be a correct choice, because the "random sample" included registered voters in N.J. - not N.J. citizens registered to vote in 1988. I must choose answer A.
Business Policy	6	Foreign ownership of American-based companies? Did this mean ownership of companies in America by foreigners, or American-based companies owning companies in foreign lands?

As these comments show, student inputs about test content have variable implications for the conduct of the testing program. In the case of the Business Policy example, it would probably be appropriate to revise the question to read "ownership by foreign interests of American-based companies," which would clarify the intended meaning. In the case of the Statistics example, the student's indicated distinction could make a significant difference, and the comment requires a careful evaluation.

Differentiating from More General Information

Listening to students cannot be an unqualified good thing; students have a variety of reactions to testing, and much of what they may say can be merely expressive of their more general attitudes. The need to focus the Student Comment Sheet on remarks primarily intended for the test developers and interpreters was recognized during its planning, and a companion program questionnaire, the TECEP Questionnaire for Students was developed. (See a completed example, Appendix B.)

The functions of this questionnaire are to secure more general information about the nature of student preparation, to obtain evaluative comment on the pragmatics of the administration, such as lighting, heating, noise level, accuracy of timing, etc., and to solicit evaluative comment and suggestion that might be helpful in improving the program generally. It is a document aimed at the test program administrator, as opposed to the test developer. It has no direct implications for the adequacy of test content or of student responses.

Function of the Student Comment Sheet in Scoring

The introduction of the Student Comment Sheet would obviously produce information that could reflect student achievement, could guide the evaluation of student work. But should it be used in this way? It was decided as a policy matter that where appropriate, the comments would be considered in decision-making about the test outcomes.

The Student Comment Sheet serves as a kind of insurance policy against the kind of error that may result from miscommunication between test-taker and test-maker. As such, its content may be considered in the context of evaluating and scoring the responses. While most student comment merely reflects student errors or lack of mastery of the subject matter, a small subset legitimately reflects valid and important problems, and may be considered in connection with the Pass/Fail decision making. For a small but important class of students, it was felt, Student Comment Sheet content may legitimately influence the decision.

The design of the Student Comment Sheet is simple and poses few difficulties. The brief "instruction" as to its use is intended to convey a sense of how the student's "messages" will be used...and how they will not be used.

The instruction says that comments may be taken into account in the scoring/grading. As a practical matter, this would only occur if a student was reasonably near the required score on the examination but somewhat below it. That is, if the student is some distance below the required score, and offers only a single detailed comment, that comment would not be provided to the grader/scorer, for it would clearly be unequal to the implied task of changing outcome. Similarly, comments will NOT be taken into account if this use would only serve to raise the scores of students who have clearly earned a Pass. Since the results of the TECEP examinations are only reported as Pass or Fail, the work of evaluating such comment sheets during scoring would have no practical effect.

The instruction to the student further assures that in no case will comment be used to worsen the student's outcome: to alter a grade from Pass to Fail. If the comment inadvertently reveals, for example, that the student gave the correct response to a multiple-choice question but for entirely erroneous reasons, the correct answer nonetheless stands.

It is recognized that the use of this information in the intrinsic work of evaluating the students is not without its potential problems. The major and obvious source of concern focuses on considerations of equity...that the new practices will favor one kind of student, who is most comfortable with their operations, at the expense of another. It is a concern that has valid bases, and the justification the new developments requires a balancing of policy considerations. The clear beneficiary of the program is the student who narrowly misses the cut-off when only the test responses themselves are appraised, but whose score may be revised to Pass using information provided by the comment.

Problems in Equitable Treatment

In one case encountered under the new practices, in a test of computer database management, recent changes in this field had created a "competitor" right answer from among the existing distractors. There were thus, in a sense, two correct answers given for the multiple-choice question. The student comment revealed an accurate perception of this, and her comment was validated by knowledgable computer professionals. Clearly, until a replacement or revision could be effected, the question could only be deleted from the scoring of this test.

But this specific case called into question the policy balancing judgments referred to earlier. While deleting the item would appropriately remove it from all future consideration in the evaluation of students, would it be fair to delete the item from the test of the individual student who reported the problem so perceptively? That is, was she entitled to a point for the knowledge revealed by her comment? She had not indicated the "correct" answer on her answer sheet, essentially guessing between the two choices she perceived as correct, and losing her guess. If she were to receive any credit, it would have to be derived from her comment sheet alone, and, indeed, the comment would have to override the marked answer.

To further complicate matters, this was not a moot question. The student was positioned precisely below the required score: if she were given a point on this question, she would receive a Pass, while if it was denied to her, even though the question was deleted from the test, she would fail.*

As this indicates, the act of empowering the student in this way, and of committing to use the data generated, can thrust upon the program a set of ethical responsibilities that is not always easy to discharge. Fairness to the individual and fairness to all test-takers may generate seemingly opposing obligations. The work of establishing policy and practice can become more complex and burdensome.

Student Comment in the Headlines

As a parenthetic comment upon such problems, reference will be made to two broadly similar cases which gave rise to headlines in recent years. The first, within the context of the Law School Admissions Test, actually led to litigation, Loucks v. LSAS. Briefly, candidate Loucks took the LSAT and passed, but also identified a question with a flaw: it had one answer that was almost right, which he thought was the one that was being keyed, and one answer that was actually right, which he thought was not being keyed. He picked the one that was actually right, in spite of his lack of confidence in the testers, then went home and wrote to ETS.

ETS agreed with his analysis, judged the item to be flawed, and deleted it from the scoring. Loucks, however, had a booklet in which he had been promised "one point for every question answered correctly." Interpreting this as contractual in nature, he sued the testing service to win either his missing point or three times the costs of his registration fee.

Loucks did not prevail, largely because he could not prove any real damages. (His ability to enter a school of law was not impeded by the slight shift of one score point.) But that merely means that, in contrast to the Thomas Edison student described above, he was not someone who has just missed a critically important level. The point is that student identification of error is not so rare, or so unimportant, that it should not be encouraged by routes such as the Student Comment Sheet. Loucks went home and wrote, rather than communicating at the test center, because there was no other program-sanctioned alternative behavior for him at the testing center. He would have been benefited, and consideration of his concerns effected more rapidly, if the possibility of this kind of error could have been accepted.

*The reader may wish at this point to reflect on his/her personal judgments concerning the proper decision. The actual TECEP program decision is therefore reported at the conclusion of the paper.

The second case, which some readers will recall, concerned the famous (or infamous) "pyramid item" from the SAT, and made headlines when a student correctly perceived that the juxtaposition of two equilateral pyramids, one of triangular base, one of square base, produced two fewer facets than the item key suggested. This student report, however, like that of Loucks was also made after the fact, from home, largely because there was no form to complete during the testing at the test center, no mention, in fact, of the possibility of such problems and of recommended ways of dealing with them.

Student Concerns on Essay Tests

Many student comments on TECEP essay tests are an attempt to explain something to the grader. Some of these explanations concern the students themselves. Although few students avail themselves of the College policies with respect to the testing of the disabled, they will report to the grader conditions such as "DeQuarvaine's Tendonitis," carpal tunnel syndrome, attention span syndrome, etc. Similarly, a student wrote: "Since I come from Europe, my handwri ing and style are different, but hopefully not too different to understand." These remarks are simply offered to the grader by the program with the instruction to use them as needed in whatever way they might be used in grading students who had been instructed by the grader in a college course. It is doubtful that they change anything.

Students will also report special, often detailed assumptions they made in the course of the examination, in responding. Thus on the tests of Written Expression, graders get these kinds of comments:

1) The Harbrace College Handbook, Tenth Edition, was used for proper usage of references, Chapter 34

2) ...instead of footnotes, I used the documentation style of the MLA

3) I used the MLA format for quotes, citations and works cited...

4) I lost my college handbook this morning.

Essay evaluations are often complex judgments. Such comments are reported by the graders to be occasionally useful in making the evaluations. They are also useful in revising the instructions, so that any student uncertainty concerning the appropriateness of, say, MLA formats, is removed.

Function of the Student Comment Sheet in Test Development

The Comment Sheets as an aggregate, of course, are of great value to the test committees. They help the committee to identify areas of student strength and weakness, and to modify the examination rapidly if needed. They supplement item analytic results and stengthen the basis for interpreting such results. They give a committee a feel for how the test is perceived by the student.

In a sense, the most potent student comment is one that benefits all of the test-takers, by leading to a revision of the test in an effort to improve it. Such "home run" comments are rare events, as would be anticipated, given the careful work of the examining committees. But the new practices open the

door for just such student-generated demonstrations, and a few of them have occurred. To date, these student successes have been primarily in the area of reporting material that has become outdated. It was student comment, for instance, that most rapidly called the program's attention to the implication of the events in Eastern Europe and the Soviet Union for the language used in the examination in Political Science. The test asked questions about "the Soviet Union" in the present tense; as the students quickly observed: "...the Soviet Union and West and East Germany no longer exist."

The consequent revisions in Political Science were largely editorial; in most cases a switch to "Russia" or to another of the former socialist republics, or to "the former Soviet Union" permitted the item in question to be retained. The nature of the questions was such that the related college courses and textbooks were not suddenly going to drop the content involved, and, indeed, the texts could not be revised as quickly as the tests, in most cases. Creating more precise language to set the historical context was all that was needed. As the student comment indicated, however, students want to take tests that are as free from flaws as they can be.

Student comment on the time allowances are often helpful in identifying tests that are somewhat too long for the time allowed. Analogously, student comment on the texts that were used to prepare can identify ways in which recommended texts may have deficiencies. In general, credit-by-examination tests are sufficiently general that any of sizable number of texts can be used to prepare. Students are now able to voice their frustration when a text turns out to be, in their judgment, inappropriate. The program, of course, does not treat such reports as a vote, but refers the student concern to an appropriate faculty member for evaluation.

Scope of the Student Responses

Most students do not need or use the Student Comment Sheet. Table 1 shows the percentages of students taking a sample of seven tests that actually handed in a sheet with comments. As it shows, the percentages range from 11% to 39%. Thus, the introduction of the sheet has not in most cases produced a burdensome wave of student comments.

TABLE 1

Percent of Test-Takers Using the Comment Sheet for Seven Typical Tests

Test	Percentage of Test-Takers Using Comment Sheet
Psychology of Personality	16%
Database Management	39%
General Physics I and II	11%
Introduction to Operations Management	13%
Organizational Behavior	25%
Principles of Finance	13%
Substance Abuse	21%

Similarly, student comments are widely scattered across the potential item or question domain: what is a concern for one student is seldom a concern for another. This is demonstrated, in the case of the Psychology of Personality test, in Table 2, which shows the frequency distribution of the 100 items in the test in terms of the number of comments they have received from a total pool of 65 comments generated by N students.

TABLE 2

Number of Items with Different Levels of Comment Received

Psychology of Personality
(65 Comments on 100 Items)

Number of Comments	Number of Items
4	1
3	4
2	9
1	31
0	55
Total	100

Tables 1 and 2 support the general confirmation of program quality that is reflected in the patterns of student comment. The relatively low level of use of the Comment Sheet, and the general diffusion of student concerns across items, confirms that the tests as a whole give few problems to students; that students feel the tests make sense and are of acceptable quality. This kind of evidence of student satisfaction is a useful supplement to the more oblique indicators in item analysis indexes of item difficulty or correlation with total test.

Changing Relationships

The nature of empowerment as a process tends to restructure the relationships of the parties to the testing. In particular, it leads to re-thinking of the rights and obligations of these parties.

The faculty of the College are informed of the program in a variety of ways. Faculty are of course deeply intersected with the operation of the credit-by-examination program, as members of a variety of test-related committees: the test committees in specific subject areas, the program advisory committee, and the Academic Council. They further serve as the reviewers and as graders to whom the individual comments are sent. The information generated by the Student Comment Sheet is of direct and immediate interest to the faculty who work in a given area. Even the student comment that is essentially an erroneous challenge to the work of a committee can be of value in helping the committee members to understand the sources of student error in the members' subject field when they meet. All of the student reports concerning a given examination that are generated between committee meetings are shared with the committee.

A related development has concerned grader-to-test-taker feedback. It became apparent that this should not be a one-way street. Where appropriate, the essay grader now prepares a comment sheet that offers the learner feedback on what was not so good about the student work...areas needing further work, or responses to student comment. This comment is not provided to all, being restricted as a practical matter to the student who needs to repeat a testing, for whom it can be of significant practical value.

Programmatic Constraints

The questionnaire feature of the program is not without its costs. Staff time must be directed to reading the communications, and staff time is required to compile information into summary reports to the committees. The nature of the TECEP program, as the activity of a specific college, greatly facilitates the introduction of the questionnaires, for there is a direct learner-institution relationship that is lacking in the broader and larger-scale operations of the major national testing programs, such as the College Board College Level Examination Program (CLEP), the American College Testing Professional Examination Program (ACT PEP), and the Defense Activity for Nontraditional Educational Services (DANTES). While issues of program economy are likely to impede the widespread application of these concepts in the administration of the national programs, it should be possible to secure this type of comment from students fairly economically, and to limit any evaluation to the small subgroup of students with the sharply pragmatic problem that they have narrowly missed the cut-off. This practice would need to be reviewed for its policy implications within each program, but there is already a considerable ethical tension in connection with the proper use of a stringent cut-score to establish the credit award. The expenses and delays encountered by adult test-takers in the context of credit-by-examination are often non-trivial. Important employer benefits, for example, may hinge upon a successful and timely completion of a program. Candidates whose work is rejected because they fail an examination by a single point are entitled to procedures that could enable them to avoid a retesting unless fully justified. If something can be done to reduce the chances that a narrow miss may be an error, it is worth doing.

Such careful review of narrow misses, is, of course of value in its own right, independent of the use of a student comment sheet. At Thomas Edison State College, the TECEP program systematically reviews the work of all students who miss the required standard by one or two points, to insure that there has not been a scoring error or an error in the student's placement of answers on the answer sheet. This review is not exceptionally burdensome: it affects about 2-3% of the test-takers. Translated to the scale of the larger CLEP program, this might mean that about 2,000 reviews a year could be required for this critically-placed group of near-miss failures. There are always problems with the introduction of review and judgment into processes that can be implemented more mechanically, but no system is perfect, and the problems with the present practices are often more tolerable merely because they are more familiar.

Summary

Most students decline the invitation to write a comment, and return the Comment Sheet unused. Many comments are of little value, and simply reflect personal misperceptions, as in the comment "I did not know if I could use extra paper..." when the instructions seem unequivocal and this is the first student who has appeared to have trouble with them. It should not be supposed that the bulk of the comments offer major insights.

But the introduction of the Student Comment Sheet has been beneficial to operation of the TECEP program. The students and the testing staff are mutually given greater protection against errors in test content, and the students whose work is very near to the critical standard are given an added opportunity to defend their work and make a satisfactory demonstration of the required competence. The proctors are freed from a kind of debriefing function. The committees receive a steady stream of valuable information as to how the students perceive and interpret the examinations.

Beyond these pragmatic benefits, however, there is a more general gain that is perhaps of heightened value in the context of a nontraditional adult college such as Thomas Edison. Inviting student comment in this way is simply a more adult way to conduct the testing program. It is appreciated by the students in part for what it connotes about the program's perception of them. As one student said, very early in the work:

> I have no comments or questions concerning this exam, but I thank you for taking the time to ask, because if I did have problems or questions, no one would ever know if you didn't ask.
>
> Emphasis added.

While such values may be of heightened concern in the adult context, they are likely to be important in any context. Tests do constrain the communications of the test-takers and there is a clear polarity between tester and test-taker. Such constraints are often stressful, particularly since there is a need to make critical interpretations of test-maker language. There is a better "atmosphere" to testing when there is a clear signal that an alternate, supplementing channel is being provided, that the voice of the test-taker will be recognized. As Wright congently reflected in the title of her paper, echoing McLuhan, our medium, the way in which we conduct our tests, conveys a message about us and about the way we perceive our work and the people we test.

*The student referred to earlier in the paper received credit for the item, and a Pass on the examination.

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Student Comment Sheet

This comment sheet may be used by any student who sees a need to add remarks. It is particularly intended for the student who thinks a question is unclear or might have more than one right answer. Please indicate the number(s) of the test question(s) to which your comment(s) refer.

Where appropriate, comment may be considered in scoring as a basis for a decision to Pass, but not Fail, a student.

The most two books I studied used the terms "horizontal" and "vertical" integration. They did not use the terms "forward" or "backward" integration. I am supposing that your use of these terms in questions 8, 11, and 18 is as follows:

Horizontal integration is that of integrating a business of the same type into another business (a producer of widgets buying another producer of widgets).

Vertical integration is that of integrating another company, that will perform a service for the buyer which the buyer is not presently capable of performing, into the operation of the purchasing company.

Forward integration is that vertical integration which acquires for the purchaser a business which the purchasing company has been providing a service, or is capable of serving on the supply side.

Backward integration is vertical integration of a company in which the buyer is acquiring a company which will provide them a service on the supply side.

Test Title: Business Policy Date:

Name: S.S.#:

Insert in FRONT of examination booklet.

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Student Comment Sheet

This comment sheet may be used by any student who sees a need to add remarks. It is particularly intended for the student who thinks a question is unclear or might have more than one right answer. Please indicate the number(s) of the test question(s) to which your comment(s) refer.

Where appropriate, comment may be considered in scoring as a basis for a decision to Pass, but not Fail, a student.

I have been in the computer field 13 yrs I feel I have a good solid background however I still think some questions were ambiguous, and I'm still not sure I pass or this test.

#15 The administrator has the ultimate responsibility although the programmer writes the code for security, checks & answers to the administrator.

#13 "National second language" is a relation but "relation" is not listed.

#77 the word "unrestricted made me feel this is false. Also "project" or "projection".

#76 "b" or "d" I knew one of these is correct answer; I chose "d".

Test Title: DBM Date:

Name: S.S.#:

Insert in FRONT of examination booklet.

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Student Comment Sheet

This comment sheet may be used by any student who sees a need to add remarks. It is particularly intended for the student who thinks a question is unclear or might have more than one right answer. Please indicate the number(s) of the test question(s) to which your comment(s) refer.

Where appropriate, comments may be considered in scoring as a basis for a decision to Pass, but not Fail, a student.

Questions 37 + 71 were confusing.
#37 is a connective device to convert electronic signals usual for the transmission through phone lines.

#71 Line spacing is different from soft ware to software — but usually by #, not alphanetical letters?

Test Title: WORD PROCESSING FUNDAMENTALS Date: _____

Name: _____ S.S.#: _____

Insert in FRONT of examination booklet.

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TECEP QUESTIONNAIRE FOR STUDENTS

Student Name _____ S.S.# _____ Date _____

INTRODUCTION TO STATISTICS

The Office of Test Development and Research needs your help. We would like each student who takes a TECEP to answer this questionnaire, in order to provide us with information to strengthen and improve the TECEP program. Last year, students earned about approximately 3850 credits by successfully passing TECEPS. Our examinations are an important means by which busy adult students such as yourself can earn credit towards a college degree. Please take the extra time to help us provide you with the best possible examination program.

TEXTS USED

The Test Description Book recommends the following texts to prepare for the examination *Introduction to Statistics:*

Minium, Edward W. and Robert Clarke. ***Elements of Statistical Reasoning***. New York: John Wiley and Sons, 1982.

Pagano, Robert R. ***Understanding Statistics in the Behavioral Sciences***. 2nd ed. St. Paul, MN: West Publishing Co., 1986.

Runyon, Richard and Audrey Haber. ***Fundamentals of Behavioral Statistics***. 6th ed. New York: McGraw-Hill Inc., 1988.

Welkowitz, Joan, et al. ***Introductory Statistics for the Behavioral Sciences***. New York: Harcourt Brace Jovanovich Inc., 1982 or 1988.

Witte, Robert S. ***Statistics***. 3rd ed. New York: Holt, Rinehart and Winston, 1989.

1. Did you use any of these? Yes ✓ No _____ ✓
2. If "Yes," which one(s)? CIRCLED (I'M BEAT CHANGED MY THE HOUR TO FILL THIS OUT AT THE TEST CENTER)
3. If you used any other texts, which one(s)? NO
4. Where did you get the book(s) that you used? BORROWED FROM A LOCAL UNIV LIBRARY. Specialty Books

Other: _____

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PREPARATION STRATEGY

5. About how many hours did you spend studying and preparing? 60 HRS

6. How much background in this subject did you have? (Prior courses, work experience, etc.)
!! - ZERO - !!

7. Did you receive any tutoring or instruction as you prepared? NO

8. Is there any preparation assistance that you believe that the College should offer to students that is not currently offered?
DIDN'T LIKE TEXT - I'm A BUSINESS MAJOR & WOULD PREFER EXAMPLES & APPLICATIONS RELEVANT TO MAJORS.

TEST TAKING PROCEDURES

9. Were the physical conditions (lighting, noise, temperature, etc.) satisfactory? Yes ✓ No_____
Comment:

10. Was the proctoring satisfactory? Yes ✓ No_____
Comment:

11. Were the instructions clear and adequate? Yes ✓ No_____
Comment:

12. Did you have enough time to complete the test? Yes ✓ No_____

13. Did you use the Supplemental Comment sheet? Yes ✓ No_____

14. Do you think the Supplemental Comment sheet is useful to students? Yes ✓ No_____
Comment:

GENERAL COMMENTS

15. Is there any way in which you believe the TECEP program could be improved? ELIMINATE STATISTICS AS A DEGREE REQUIREMENT !!!

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